

IN THE CLAIMS

Upon entry of the present amendment, the status of the claims will be as is shown below. This listing of claims replaces all previous versions and listings of claims in the present application.

Claims 1-37 (Cancelled)

38. (Currently Amended) A fluid mixing device, comprising:

a cup defining a chamber;

a bluff body extending across and substantially closing one end of the chamber;

a first fluid inlet disposed at an opposite end of said chamber from said bluff body and arranged to direct a jet fluid flow into the chamber toward said bluff body;

~~a flow divider defined by an internal periphery and an external periphery and~~ disposed in a region substantially surrounding said bluff body and extending from within said chamber to outside of said chamber;

at least one second fluid inlet to said chamber defined by said flow divider in said region substantially surrounding said bluff body and arranged to direct a fluid flow opposing the jet fluid flow into the chamber, said chamber being substantially free of fluid flow obstructions extending in a direction transverse to the jet fluid flow in a region between said second fluid inlet and said first fluid inlet; and

at least one mixed fluid outlet from said chamber defined by said flow divider in said region substantially surrounding said bluff body.

39. (Currently Amended) A fluid mixing device, comprising:

a cup defining a chamber;

a bluff body extending across and substantially closing one end of the chamber;  
a first fluid inlet disposed at an opposite end of said chamber from said bluff body  
and arranged to direct a jet fluid flow into the chamber toward said bluff body;  
a flow divider disposed in a region substantially surrounding said bluff body and  
extending from within said chamber to outside of said chamber;  
at least one second fluid inlet to said chamber defined by said flow divider in said  
region substantially surrounding said bluff body and arranged to direct a fluid flow opposing  
the jet fluid flow into the chamber, and  
at least one mixed fluid outlet from said chamber defined by said flow divider in said  
region substantially surrounding said bluff body, as claimed in claim 38,

wherein said bluff body includes an egress for releasing fluid from said chamber.

40. (Previously Presented) A fluid mixing device as claimed in claim 39,

wherein said egress includes material porous to said fluids forming at least part of said bluff body.

41. (Previously Presented) A fluid mixing device as claimed in claim 39,

wherein said egress includes one or more apertures extending through said bluff body.

42. (Previously Presented) A fluid mixing device as claimed in claim 41,

wherein said bluff body includes a centrally disposed aperture.

43. (Previously Presented) A fluid mixing device as claimed in claim 42,

wherein said first fluid inlet is directed substantially toward said centrally disposed aperture.

44. (Previously Presented) A fluid mixing device as claimed in claim 43,

wherein said aperture has a circular cross section.

45. (Previously Presented) A fluid mixing device as claimed claim 38,  
wherein said flow divider defines a series of flow channels which form said second fluid inlets and said mixed fluid outlets.

46. (Previously Presented) A fluid mixing device as claimed in claim 45,  
wherein alternate ones of said flow channels spaced around said bluff body form said second fluid inlets and said mixed fluid outlets.

47. (Currently Amended) A fluid mixing device, comprising:  
a cup defining a chamber;  
a bluff body extending across and substantially closing one end of the chamber;  
a first fluid inlet disposed at an opposite end of said chamber from said bluff body  
and arranged to direct a jet fluid flow into the chamber toward said bluff body;  
a flow divider disposed in a region substantially surrounding said bluff body and  
extending from within said chamber to outside of said chamber;  
at least one second fluid inlet to said chamber defined by said flow divider in said  
region substantially surrounding said bluff body and arranged to direct a fluid flow opposing  
the jet fluid flow into the chamber, and  
at least one mixed fluid outlet from said chamber defined by said flow divider in said  
region substantially surrounding said bluff body, as claimed in claim 46,

wherein said flow divider has a corrugated profile so as to repeatedly cross said region surrounding the bluff body.

48. (Previously Presented) A fluid mixing device as claimed in claim 47,  
wherein said chamber includes an outer wall extending substantially around the

perimeter of said region surrounding the bluff body.

49. (Previously Presented) A fluid mixing device as claimed in claim 48, wherein said corrugated profile alternately contacts the bluff body and said outer wall.

50. (Previously Presented) A fluid mixing device as claimed in claim 49, wherein the geometric centers of the cross-section of each of the flow channels defined by said corrugated profile are alternately substantially closer to the outer wall and substantially closer to the bluff body.

51. (Previously Presented) A fluid mixing device as claimed in claim 50, wherein the flow channels having cross-sections with geometric centers substantially closer to the outer wall form said second fluid inlets and the flow channels having cross-sections with geometric centers substantially closer to the bluff body form said mixed fluid outlets.

52. (Previously Presented) A fluid mixing device as claimed in claim 47, wherein said corrugated profile is of triangular form so that said flow channels are generally triangular in cross section.

53. (Previously Presented) A fluid mixing device as claimed in claim 52, wherein at least alternate flow channels have substantially the same cross section size.

54. (Previously Presented) A fluid mixing device as claimed in claim 53, wherein said corrugated profile defines eight flow channels forming second fluid inlets each alternately interposed with eight flow channels forming mixed fluid outlets.

55. (Previously Presented) A fluid mixing device as claimed in claim 54, wherein the mixing device has eight-fold azimuthal symmetry about a longitudinal

axis.

56. (Previously Presented) A fluid mixing device as claimed in claim 38, wherein the flow divider protrudes beyond said bluff body.

57. (Cancelled)

58. (Previously Presented) A fluid mixing device as claimed in claim 38, wherein said first fluid inlet extends toward said bluff body from said opposite end of said chamber.

59. (Currently Amended) A fluid mixing device as claimed in claim 58, wherein the spacing  $h$  of an opening of the first fluid inlet from said opposite end of said chamber-said bluff body satisfies the relationship  $0 < h/L < 1$

where  $L$  is the distance from the opposite end to the bluff body,

wherein the ratio  $h/L$  is about 0.4.

60. (Cancelled)

61. (Currently Amended) A fluid mixing device as claimed in claim 38, wherein ~~said chamber is formed by a generally cup-shaped body with said bluff body is disposed at or adjacent an open end of said~~ cup-shaped body.

62. (Currently Amended) A fluid mixing device as claimed in claim 61, wherein said first fluid inlet is centrally disposed in ~~the~~ a base of said cup-shaped body.

63. (Currently Amended) A fluid mixing device as claimed in claim 61, wherein said flow divider extends between ~~the~~ a wall of said cup-shaped body adjacent the open end and said bluff body.

64. (Currently Amended) A fluid mixing device as claimed in claim 63,

wherein said flow divider is fixed to the wall of said ~~cup-cup-shaped body~~.

65. (Previously Presented) A fluid mixing device as claimed in claim 38,  
wherein said mixing device is a burner.

66. (Previously Presented) A fluid mixing device as claimed in claim 65,  
wherein said first fluid inlet supplies combustible fuel and said second fluid inlets  
supply air to the chamber.

67. (Previously Presented) A fluid mixing device as claimed in claim 66,  
wherein said combustible fuel is a gaseous fuel.

68. (Previously Presented) A fluid mixing device as claimed in claim 66,  
wherein said combustible fuel is a gaseous hydrocarbon fuel.

69. (Previously Presented) The fluid mixing device of claim 38,  
wherein a direction of fluid entry to said chamber from said first fluid inlet is  
substantially opposite a direction of fluid entry to said chamber from said at least one  
second fluid inlet.

Claims 70-71 (Cancelled)